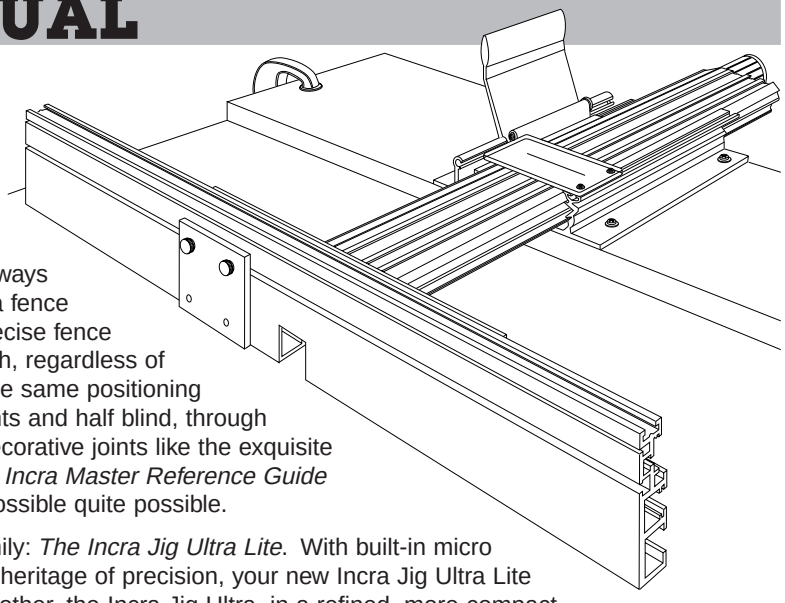
Incra® Jig ULTRALITE™

From the makers of Incra Jig!

Precision Woodworking System

OWNER'S MANUAL



Please read this Owner's Manual before use and keep it at hand for reference.

In the few years since its first appearance in woodworking shops around the globe, Incra Jig has quickly established itself as the finest and most versatile woodworking system available. At the top of its list of features has always been its unparalleled positioning accuracy. As a fence system, Incra Jig's amazing precision allows precise fence placement to within a few thousandths of an inch, regardless of your skill level. As a joint making machine, these same positioning capabilities permit an endless variety of box joints and half blind, through and sliding dovetails to be created. And with decorative joints like the exquisite Incra Double Dovetail (described in the optional *Incra Master Reference Guide and Template Library*), Incra Jig makes the impossible quite possible.

Introducing the newest member of the Incra family: *The Incra Jig Ultra Lite*. With built-in micro adjusting, velvet smooth tracking, and the Incra heritage of precision, your new Incra Jig Ultra Lite combines some of the best features of its big brother, the Incra Jig Ultra, in a refined, more compact unit perfect for the router table or drill press. The Ultra Lite carries on the tradition of performance and accuracy you've come to expect from the Incra line of precision tools.

SAFETY

- Important safety instructions for using the Incra Jig Ultra Lite: before using the Incra Jig Ultra Lite, read and follow all of the instructions and safety information in this manual.
- When using Incra Jig Ultra Lite in conjunction with any other tool, first read and follow all instructions and safety information in that tool's owner's manual.
- When Incra Jig Ultra Lite is mounted to a wooden base or table surface, make sure that all six mounting screws are securely tightened and the Incra Jig Ultra Lite is firmly held in place.
- When using the Incra Jig Ultra Lite with a wooden base, always make sure that the base is securely clamped, screwed, or otherwise fastened to the work surface before making a cut.
- Always turn off the power and make sure that the bit or blade is fully stationary before moving the Incra Jig Ultra Lite to any new setting.
- Always keep both hands behind the fence when moving the Incra Jig Ultra Lite to any new setting.
- Before making a cut, always make sure that the carriage clamp is fully engaged and the jig is securely locked in place.
- When using the Incra Jig Ultra Lite with other tools, make sure that all safety guards and other safety equipment supplied by the manufacturer of that tool are securely in place and functional. Never let the Incra Jig Ultra Lite interfere with another tool's safety equipment.
- Use appropriate safety devices. Keep hands clear of the bit or blade. Always use a push stick, rubber soled push block, or other safety devices to keep your hands safely away from the cutting tool.
- Wear safety glasses, hearing protection, and a dust mask, and follow all normal shop safety practices.
- Do not alter or modify the Incra Jig Ultra Lite in an attempt to use it with non-Incra accessories.

CONTENTS

SETUP

1 Attach the Incra Jig Ultra Lite to a 3/4" plywood base

Begin with a piece of 3/4" plywood (or hardwood) that is 8" wide. The length of the plywood should match the width of your router table. Clamp the plywood to the edge of your router table using (2) C-clamps. Mark the center of the plywood's length and position the operator's side of the Ultra Lite's base 2 1/4" from the center mark. See Fig. 1. Attach the base to the plywood through the six holes using (6) #10 x 7/8" phillips pan head wood screws and #10 flat washers.

2 Attach hairline cursor to base

Place one of the #6 flat washers on each of the #6-32 x 3/8" screws. Insert the screws through the holes in the plastic cursor and loosely attach the #6-32 hex nuts. slide the two nuts into the T-slot at the front of the Ultra Lite's base as shown in Fig. 1a. Align the cursor flush with edge of the base and tighten the mounting screws.

3 Attach the Incra Fence

With the plywood base still clamped to the edge of your router table, carefully slide the carriage into the base and pull the carriage clamp up into the locked position. Insert the #10-32 x 1 1/8" phillips pan head screws through the thick (gold) washers, then through the holes on the back of the fence mounting bracket. Place a thin (silver) washer on the end of each screw, then loosely attach the rectangular nut. See Fig. 2. The raised rim on the nut should face toward the mounting bracket. Now slide the thin washer and rectangular nut into the T-slot on the back of the Incra Fence. Make sure the thin washer is captured in the T-slot provided as shown in Fig 3. Position the fence so that the mounting bracket is approximately centered on the fence length and tighten the two mounting screws.

TIP

To achieve a silky smooth carriage motion when moving the fence, it is important that your table surface is flat and smooth. If you find that your carriage tends to bind slightly during some portion of its travel, try loosening the fence mounting screws then retightening at different locations along the table's length.

FIG. 1
Attach Ultra Lite to 3/4" plywood base

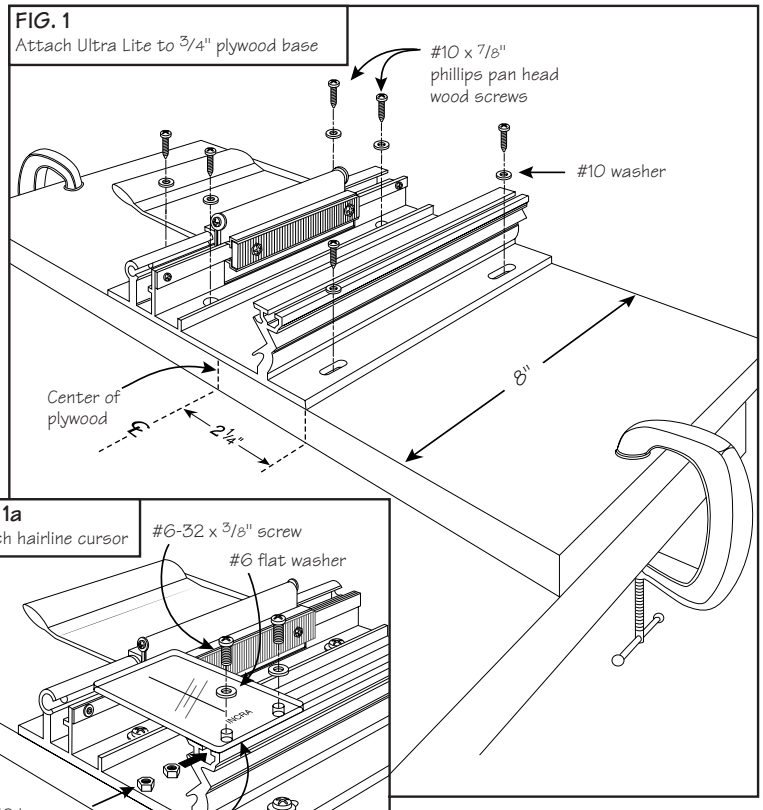


FIG. 1a
Attach hairline cursor

FIG. 2
Attach the Incra Fence

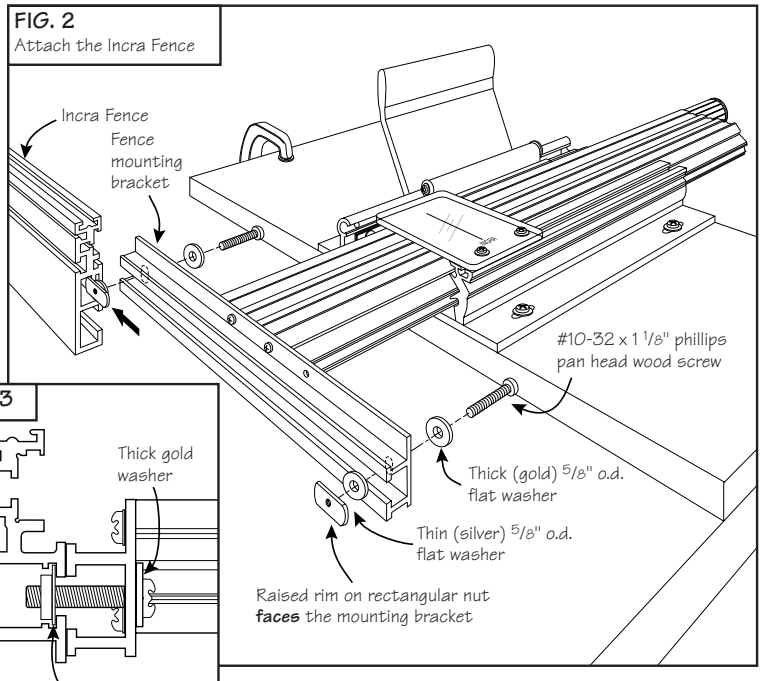
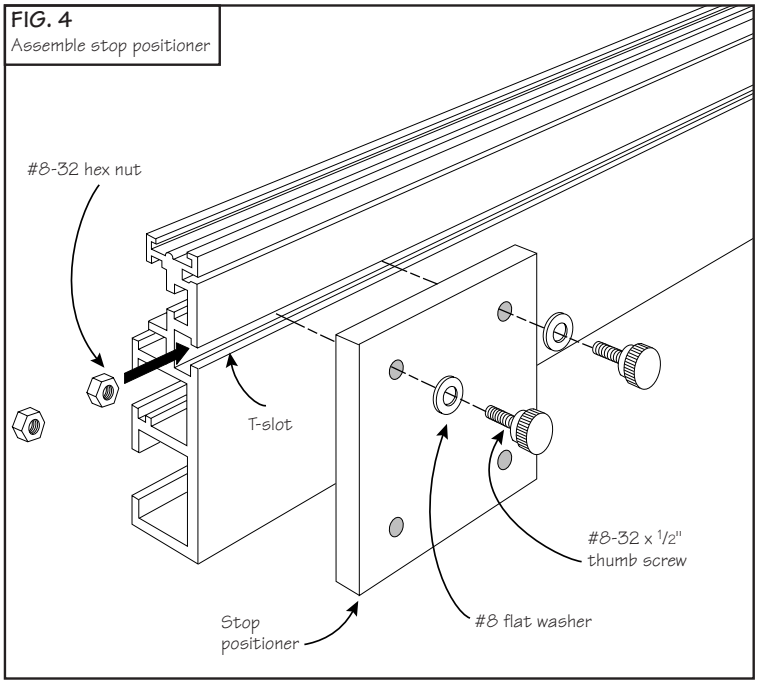


FIG. 3

4 Assemble stop positioner

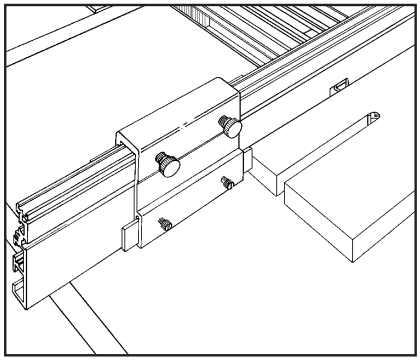
Place a #8 flat washer on each of the (2) #8-32 x ½" thumb screws and insert through two of the holes in the black plastic stop positioner. Loosely install the (2) #8-32 hex nuts, then slide the nuts into the T-slot on the front of the Incra Fence. Fig. 4. When not in use, simply slide the stop positioner off the fence.

FIG. 4
Assemble stop positioner



Fence upgrade option:

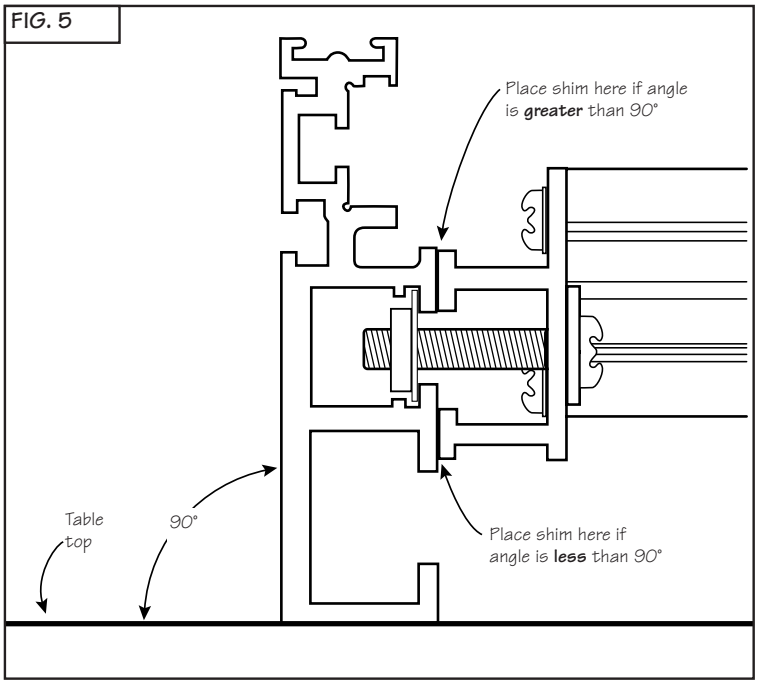
If you wish to upgrade your Incra Fence to add the ultra-precise stop positioning abilities of the New Incra Stop, see the fence upgrade package offered on page 16.



5 Adjusting the fence angle

After mounting the Incra Fence to your Ultra Lite, check the angle of the fence to the router table using a machinist's or carpenter's square. Sometimes, as a result of the plywood not being perfectly flat, the angle may be slightly more or less than 90°. To correct the angle, place a masking tape shim between the mounting bracket and the fence as shown in Fig. 5.

FIG. 5



MAINTENANCE

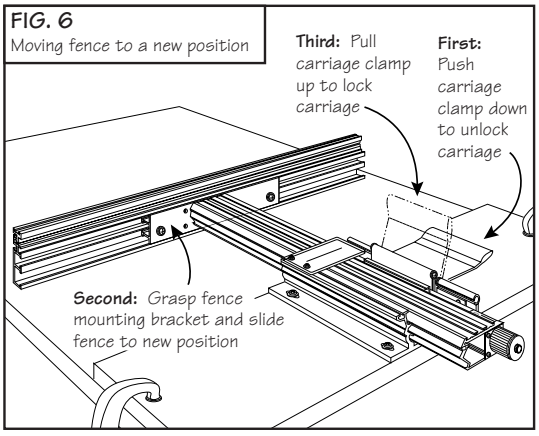
In general, just keeping your Incra Jig clean is all you need to do to keep the tool in tip top shape. Occasionally, remove the carriage from the base and brush or blow out any sawdust or debris that may have accumulated on the base and the UHMW guide bearing strips. Use a toothbrush to clean the teeth on the Incra racks on both the carriage clamp and on the carriage.

Moving to a new scale setting

With the plywood base clamped to the stationary tool of your choice, moving the fence to any new scale setting is simple. First, push the carriage clamp down and release the clamp handle to unlock the carriage. Grasp the fence mounting bracket as shown in Fig. 6 and slide the fence to the new position, aligning the mark on the scale or template directly under the hairline cursor. To secure the carriage at the new scale location, simply pull the carriage clamp handle up into the locked position. When moving the carriage, take care not to accidentally slide the scale in its slot. **Caution:** For your safety, keep both hands behind the fence when moving to any new scale position.

TIP Although the clamping pressure has been factory adjusted, you may wish to fine-tune the pressure to suit your individual preference. If so, use the thin plastic shims provided and follow the instructions shown on page 14.

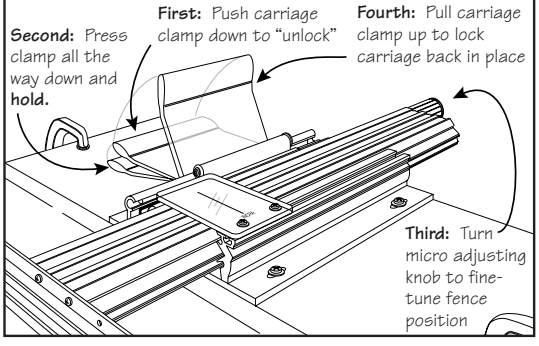
FIG. 6
Moving fence to a new position



Micro adjusting

The micro adjust feature of your new Incra Jig Ultra Lite allows for precise positioning of the fence to any location between the 1/32" tooth spacing of the Incra sawtoothed racks. You'll find this feature extremely handy the next time you need to widen a mortise by a few thousandths of an inch for a great fitting mortise and tenon joint. Use the micro adjuster for a flawless fit when cutting grooves to accept inlay strips, or to loosen up a tight fitting box joint cut with an undersized bit. You'll find it especially useful for setup operations like "zeroing" (page 5) or "centering" (page 7). Here's a step-by-step look at operating your Ultra Lite micro adjuster. See Fig. 7 as you follow the steps

FIG. 7
Micro adjusting



1 Unlock the carriage clamp

Push the carriage clamp down to unlock the carriage.

2 Engage the micro adjust mechanism

Continue pushing the carriage clamp handle down until it touches your plywood sub-base, then hold it there.

3 Micro adjust the fence position

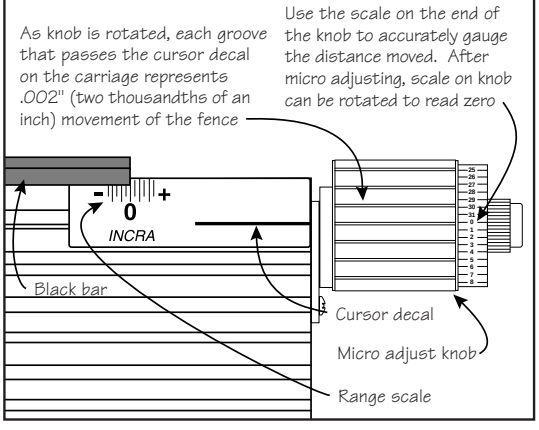
Turn the micro adjust knob clockwise to move the fence toward the cutter (forward), counterclockwise to move the fence away from the cutter (backward). The carriage clamp handle must be held down as the knob is turned.

4 Lock the carriage clamp

Pull the carriage clamp up to lock the carriage back in place. Gauging the distance moved when micro adjusting is easy. A full turn of the knob equals 1/32" of adjustment; a half turn equals 1/64". For smaller adjustments, use the grooves on the knob as a reference. For each groove that passes the corresponding cursor decal on the carriage (see Fig. 8), you have moved the fence .002" (two thousandths of an inch). At the end of the knob, you'll find a scale that can be aligned to read zero at any of the grooves on the knob. This allows you to re-zero the scale after any micro adjustment. Simply loosen the thumbscrew to rotate the scale.

The micro adjust feature of the Incra Jig Ultra Lite has as adjustment range of ±5/32" from mid-range. The range scale decal on the carriage shows how much range remains in either direction. To read the scale, just sight along the end of the black bar that holds the blue Incra racks. When the end of the black bar is aligned with the zero on the range scale, you are at mid-range. See Fig. 8.

FIG. 8
Micro adjust scale



TIP To avoid running out of micro adjustment range in the middle of a project, you need to remember two things. First always micro adjust back to mid-range before beginning a new project. Second, whenever you need to micro adjust a distance greater than 1/32", use the Incra positioning racks to get as close as possible before reaching for the micro adjust knob.

APPLICATIONS/GENERAL PURPOSE FENCE

The essence of any Incra Jig is its ability to accurately position your board for a cutting operation. In a nutshell, it is a precision fence system. Even when used as a joint maker, the fact is, you are simply applying a technique to a very accurate fence system in order to produce the various possible joints. Using your Incra Jig Ultra Lite as a general purpose fence is just as easy as using any other fence in your shop. In fact, it shares in common four things that all fences have: the straight edge or fence that your board will be pushed along as you make a cut, a scale, a hairline cursor, and a clamp. You will use your Incra Fence as you would any fence, that is, first you'll unclamp, then look through the hairline cursor as you move the fence. When you see your measurement come under the hairline, you'll clamp the fence in place. Of course, this is where the comparison ends because, unlike other fences, when you clamp your Incra Jig Ultra Lite in place, it is exactly where you want it to be. Just get the mark on the scale close to the hairline cursor and the automatic positioning controls of the patented Incra racks move the fence to the exact location as you clamp the jig in place. It's just that easy. You're sure to find many places in your shop where the precision of the Ultra Lite will benefit you and your work.

To use Incra Jig Ultra Lite at your router table, position the plywood base on your router table top as shown in Fig. 9. The fence should always be on the right hand side of the router bit as seen from the operator's side of the table. If you do not yet own a router table top, the dimensions shown in Fig. 10 will produce a comfortable table size which allows enough room to use the full range of your Incra Jig Ultra Lite. Now all you need to do is install a router bit and "zero" the fence to the bit.

FIG. 9
Ultra Lite at the router table

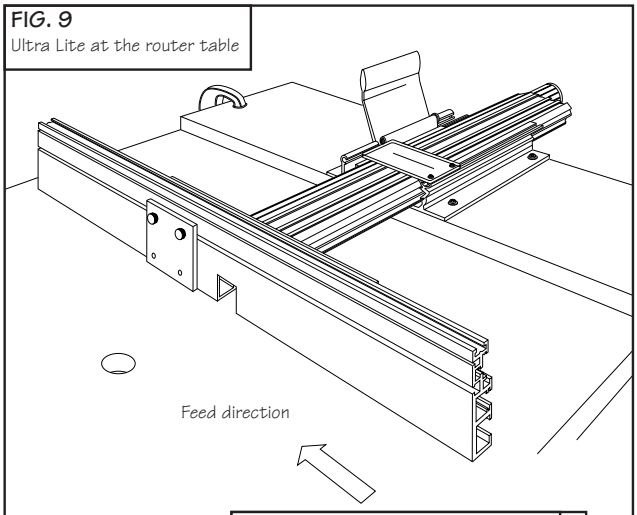
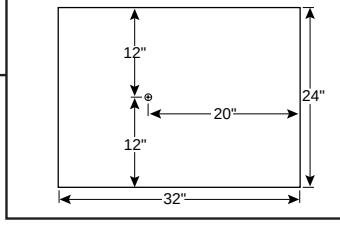


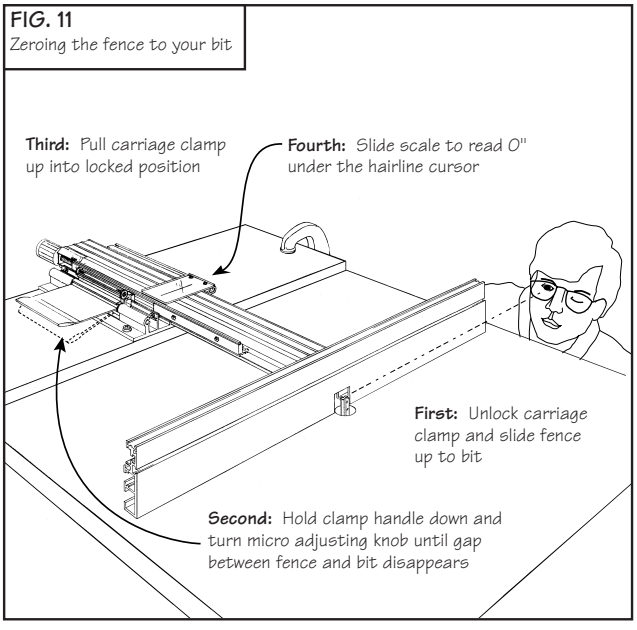
FIG. 10
Router table top suggested dimensions



"Zeroing" the Fence to your Router Bit

In order to ensure accurate results from any fence for general purpose cutting, the fence must first be "zeroed" to the cutter. To zero your Incra Fence to the cutter, release the carriage clamp and slide the fence up to the edge of the cutter. Sight down the length of the fence to check for a gap between the fence and the cutter. Fine-tune any remaining distance by holding the clamp handle down as you micro adjust the fence position. When the gap of light disappears, the cutter will be "zero" distance from the fence. Check to make sure that the router bit is safely centered on the opening in the fence. Return the carriage clamp to the locked position, then slide the 1/32" scale to read 0" under the hairline cursor. See Fig. 11.

FIG. 11
Zeroing the fence to your bit



TIP

For a truly precise "zeroed" setup, follow the instructions above, then move your fence to a scale reading of 1/4" and make a test cut on a piece of scrap stock. (Make sure the scrap stock has a square edge and that this edge is against the fence during the cut.)

Use a pair of machinist calipers to measure the distance between the groove and the edge of the board. If it does not measure exactly .250" (1/4"), just use the micro adjuster to accurately fine-tune the remaining distance.

Joint making represents one of the most exciting applications for your new Incra Jig Ultra Lite. Just by applying a little technique to the accuracy of your Incra Jig, you'll soon be able to add joinery for box and drawer making to your list of shop skills. The two templates included with the basic set will allow you to produce equally spaced 3/8" box joints and equally spaced 1/2" half blind dovetails.

There are three important operations that must take place each time you use your Incra Jig for joint making at the router table:

1. Setting the router bit depth of cut
2. Centering the bit on your workpiece and installing the template
3. Cutting the joint

We'll begin with a look at the first two operations. These are simple setup procedures with which you will want to become familiar. They will be used every time you prepare to cut a joint at your router table. Beginning on page 10, we will apply these two setup operations in a step-by-step description for cutting box joints and half blind dovetails.

Setting the Router Bit Depth of Cut for Box Joints

After installing the appropriate diameter straight bit for the template pattern you have selected, (a 3/8" straight bit is required for the Box1 template included with your Ultra Lite System) simply raise or lower the bit in your router table to set the depth of cut at slightly greater than the thickness of the stock you will be cutting. See Fig. 12. Just remember, router bit manufacturers suggest that you not cut any deeper than the diameter of the bit in any single pass.

Setting the Router Bit Depth of Cut for Dovetail Joints

As with any half blind dovetail jig, the depth of cut of your dovetail bit will determine how well the finished joint fits. Just a little practice using the following steps will ensure that your dovetail joints will always have a perfect fit.

1 Set the approximate depth of cut

Install the dovetail bit that corresponds to the template you are using. (A 1/2", 14° dovetail bit is required for the DOV1 template included with your Ultra Lite System.) Raise or lower the bit to the approximate depth of cut listed under the diagram of your template pattern. (1/4" for the DOV1 template, see diagram on page 11.) Position your fence as shown in Fig. 13 so that about half of the bit is inside the fence notch. Now slide the 1/32" scale on your Incra Jig to read 0" under the hairline cursor.

2 Make the test cuts

Clamp two pieces of square cut stock to your Right Angle Fixture. You are now going to make two dovetail cuts on the boards as shown in Fig. 14. The spacing between these two cuts is listed under the diagram of your selected joint pattern. For example; if you were setting the depth of cut for the DOV1 pattern included with the Ultra Lite System, the diagram shows: Spacing to set depth of cut = 7/8". Using the 1/32" scale set in Step 1, you would make a cut at the 0" setting, then move to 7/8" to make the second cut.

More Joinery Templates

For even more variety, including through and double dovetail techniques, the optional *Incra Master Reference Guide and Template Library* contains a large selection of new joinery templates. For pricing and ordering information, see page 16.

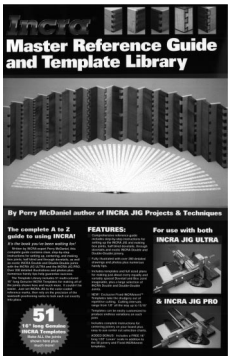


FIG. 12
Depth of cut for box joints

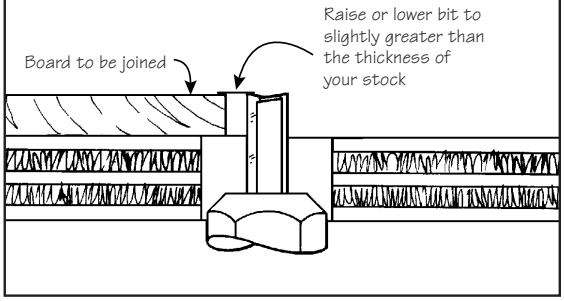


FIG. 13
Set approximate depth of cut

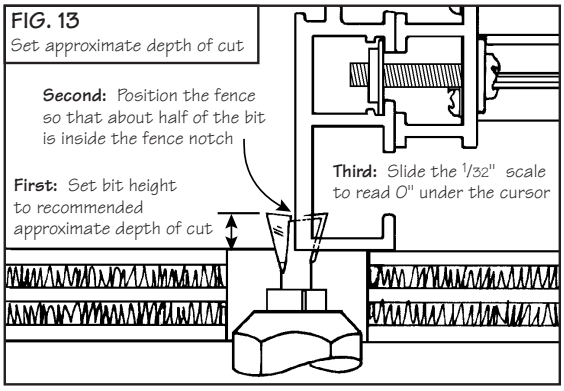
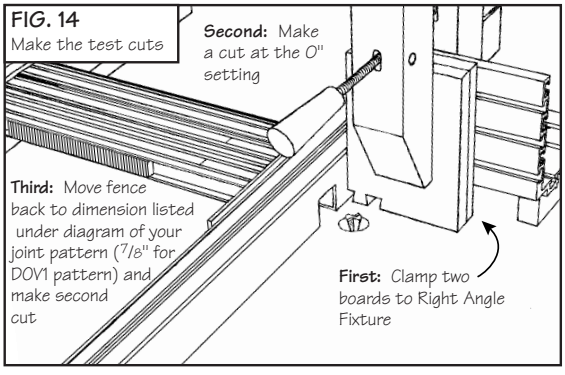


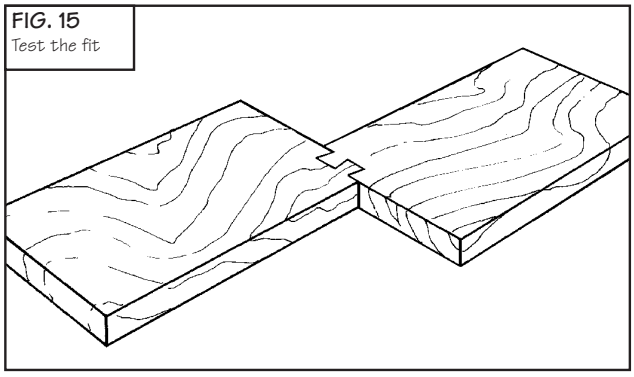
FIG. 14
Make the test cuts



3 Test the fit and adjust as necessary

Unclamp the two boards and test the fit by joining them as shown in Fig. 15. As with any half blind dovetail jig, a little trial and error is needed to achieve a snug fitting joint. To tighten the fit, raise the bit up slightly; to loosen the fit, lower the bit slightly. Just remember this phrase: **"Heighten to tighten, lower to loosen."** After adjusting the bit height, make a new set of trial cuts on the opposite end of the boards. After a few adjustments and trial cuts, you'll have a perfect fit. If you'll mark the properly fitting cuts on one edge of the boards, you can save this piece to use as a depth gauge the next time you set up this particular bit for joinery.

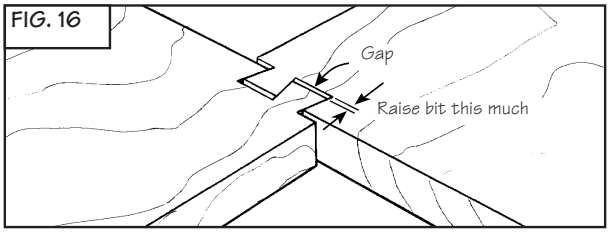
FIG. 15
Test the fit



TIP

When the fit is too loose, the trial cuts provide a gauge to let you know how much to raise the bit. Just join the trial pieces end to end and gently pull the boards to wedge the dovetails together. The gap that appears is equal to the distance you need to raise your dovetail bit to achieve a tight fit. See Fig. 16.

FIG. 16



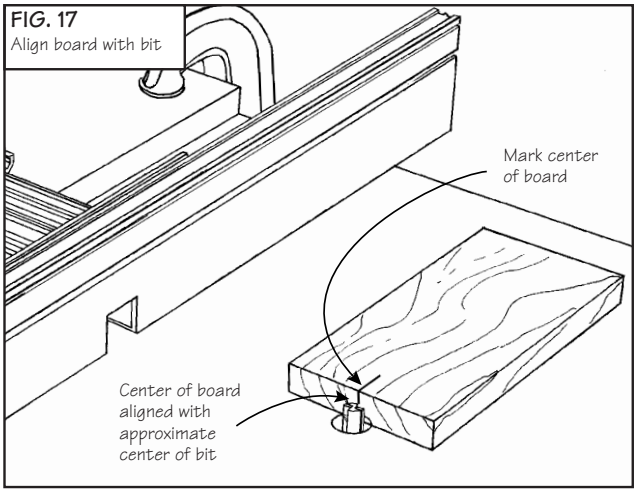
Centering the Router Bit on your Workpiece

After setting your router bit depth of cut, you need to position your Incra Jig and install the joinery template so that all the cuts are made in the right places on your wood. This is accomplished through a setup operation called "centering". Centering locates your Incra Jig so that the router bit is aligned with the center of the stock width you wish to use. Once you find the center, install the selected template and you'll be ready to cut a perfect joint. The simple steps to follow should always be used when setting up your Incra Jig for joint making.

1 Align board with bit

Begin by cutting a piece of ¾" thick stock to the same width as the boards you wish to join later on. Mark the center of this piece's width on one end and place the board face down on the router table with the center of the board aligned with the approximate center of the bit. See Fig. 17.

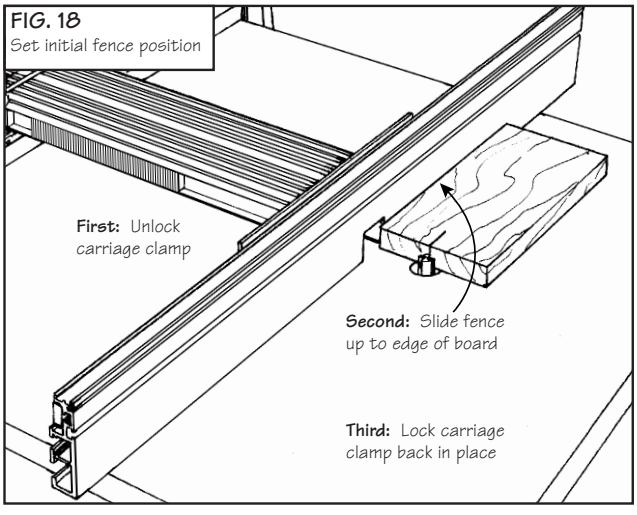
FIG. 17
Align board with bit



2 Set initial fence position

Unlock the carriage clamp and slide the fence up to the edge of the board, then lock the carriage clamp back in place. See Fig. 18. Make sure the center mark on the board is still aligned with the approximate center of the router bit.

FIG. 18
Set initial fence position



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3 Rout the test groove

Turn the router on, and using a good rubber soled push block, cut a groove along the entire length of the board. See Fig. 19. Now turn the stock end for end with the groove still face down and make a second pass over the router bit. The second pass should widen the groove slightly (unless you are already perfectly centered). Make sure you have turned the stock end for end before making the second pass. (This places the center mark at the back of the board.)

4 Fine-tune the fence position

With the router unplugged, turn the bit to its widest cut angle (viewed from the infeed side of the router table). Place the board against the fence with the router bit just inside the test groove cut. There should be a small gap between the edge of the bit and one side of the groove. See Fig. 20.

Now all that is needed is to micro adjust the fence position so that with the board against the fence, the bit is in the center of the groove. Use the Ultra Lite's micro adjuster to move the fence until there appears to be an equal gap on both sides of the router bit. See Fig. 21. Once the bit is in the middle of the groove, make sure to lock the carriage clamp in place.

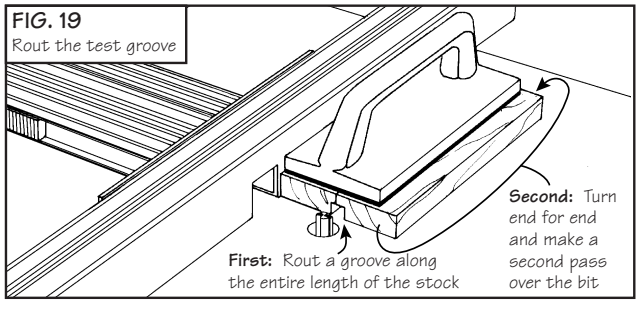

FIG. 19
Rout the test groove

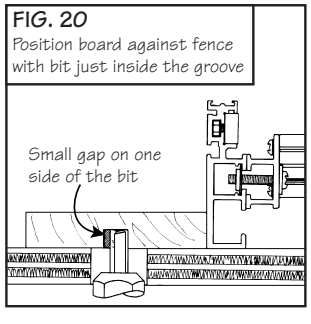

FIG. 20
Position board against fence with bit just inside the groove

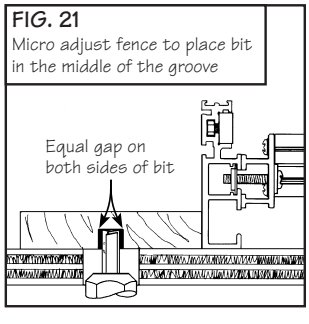

FIG. 21
Micro adjust fence to place bit in the middle of the groove

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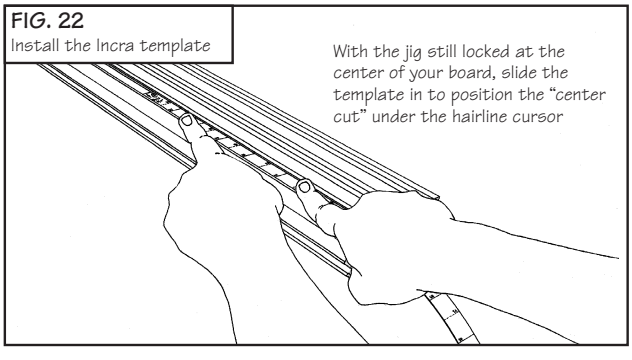
5 Once you have successfully found the center of the board's width with your router bit, slide the template you have selected for joinery into one of the scale slots on your Incra Jig's carriage. This must always be done with the carriage still locked at the center position you just found. Slide the template until the suggested center cut on the template is directly under the hairline cursor. You'll find the suggested center cut listed under the diagram of each template pattern shown above. You are now ready to cut the joint.

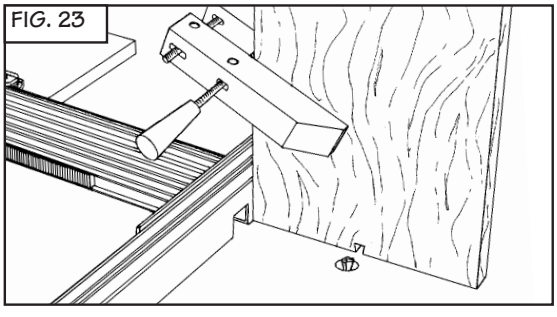
FIG. 22
Install the Incra template



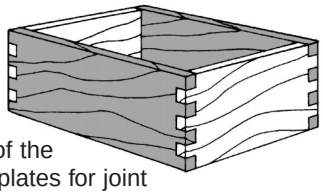
TIP

In order to save wood when centering the bit on wide stock, just leave one of the boards you've cut for your box about an inch to two longer than necessary. Clamp this piece to your Right Angle Fixture as shown in Fig. 23 and make the test cuts described in Step 3 through the end of the board, flipping the piece edge for edge before making the second cut. After you are centered, just crosscut the extra length off of the board's end.

FIG. 23



Box Joints



One of the easiest of the many interlocking joints that can be cut with your Incra Jig, box joints provide a good introduction to the use of the Ultra Lite and the joinery templates for joint making. Just follow these steps to learn how:

1 You'll want to begin by cutting your stock to the lengths and widths necessary for your box construction. Also cut a piece of ¾" thick stock to the same width for use in centering later on.

2 Install a ⅜" straight bit in your router table and set the depth of cut to slightly greater than the thickness of your stock.

3 Center the bit on your stock width and install the template. Use the centering method described on page 7 to find the center of your board's width with the router bit, Fig. 25. Remember, the board used for the test cuts must be the same width as the pieces you will be joining later on. After finding the center, slide the BOX1 template into one of the auxiliary scale slots and position the suggested center cut (9B) directly under the hairline cursor.

4 Clamp two of your boards to the Right Angle Fixture with a backing board as shown in Fig. 26. (You can use your centering board from Step 3 as a backing board if you like.) The backing board is used to prevent splintering as the router bit exits the cut. Make cuts at the "A" marks on the template. Of course, you will only need to make the "A" cuts that position the boards in line with the router bit. After completing the cuts, flip the boards end for end and repeat the same cuts. Now clamp the remaining two boards with a backing board to the Right Angle Fixture as shown in Fig. 27 and make the "B" series of cuts. Repeat these "B" cuts on the opposite end of the boards.

Too tight or too loose?

Check the fit of your completed pieces. If the joint is too tight or too loose, the problem is the router bit, not your Incra Jig. An oversized bit will create a loose fit, while an undersized bit will cut a tight joint. To loosen the tight fitting joint, you can micro adjust the fence backward about five thousandths of an inch and then re-cut one of the series of cuts.

TIP The first cut on either the "A" or "B" series of cuts will be an open cut. This means you will be cutting away the edge of the board adjacent to the fence. To keep this edge cut clean and splinterfree, begin with a light 1/32" wide scoring pass, then sneak up to the first template mark in several light side-by-side passes. See Fig. 28.

FIG. 28

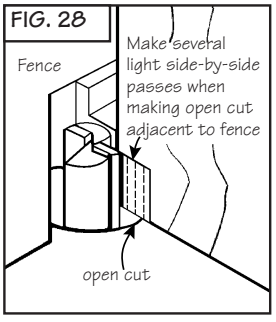


FIG. 24
Set depth of cut

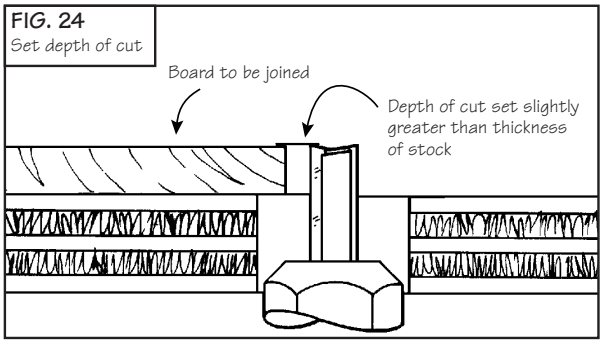


FIG. 25
Center bit on your stock width

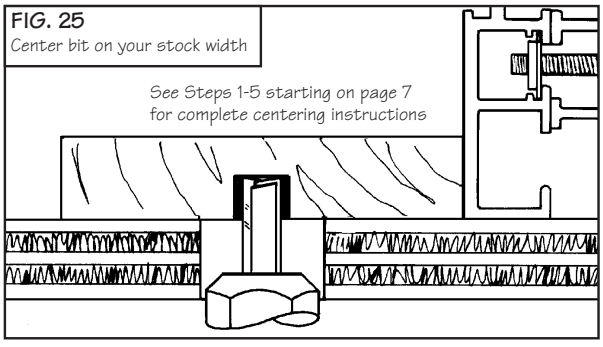


FIG. 26
Make the "A" cuts

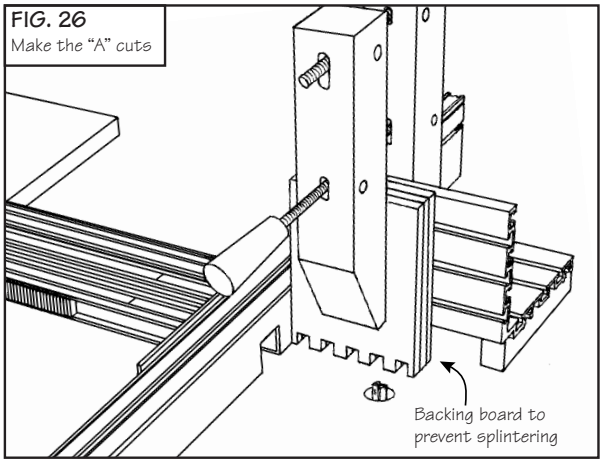
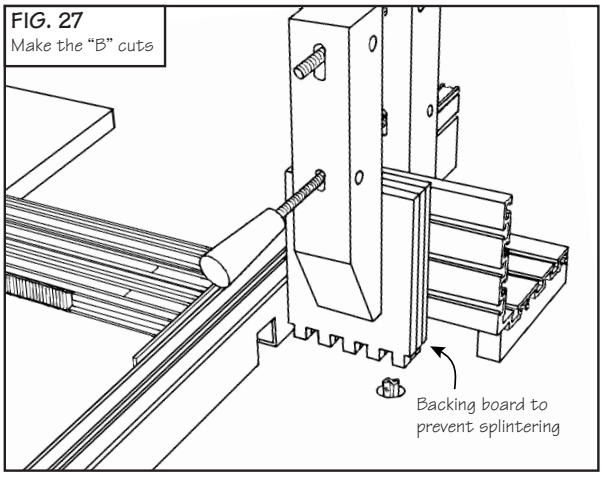
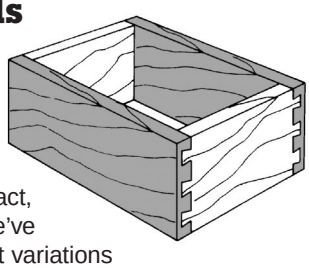


FIG. 27
Make the "B" cuts



Half Blind Dovetails



The easiest of the dovetail joints, half blind dovetails add strength and beauty to your joinery. They are also the most versatile of the many joints you can cut with your Incra Jig. In fact, many of the decorative joints we've designed over the years are just variations on the half blind technique you are about to learn. Once you've mastered the steps below, you'll find these decorative joints (described in the optional *Incra Master Reference Guide and Template Library* and in the *Incra Jig Projects & Techniques* book) quite easy to complete.

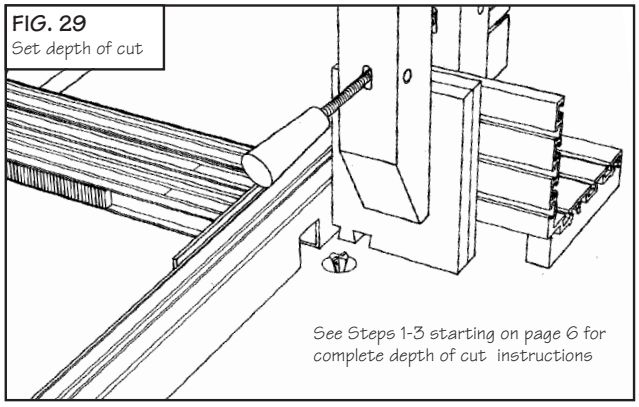
1 You'll want to begin by cutting your stock to the lengths and widths necessary for your box construction. Also cut a piece of ¾" thick stock to the same width to use in centering later on.

2 Install a ½" 14° dovetail bit in your router table and set the depth of cut as described on page 6. The two trial cuts should be spaced ⅞" apart for the DOV1 template.

3 Center the bit on your stock width and install the template. Use the centering method described on page 7 to find the center of your board's width. Remember, the board used for the test cuts must be the same width as the pieces you will be joining later on. After finding the center, slide the DOV1 template into one of the auxiliary scale slots and position the suggested center cut (8B) directly under the hairline cursor.

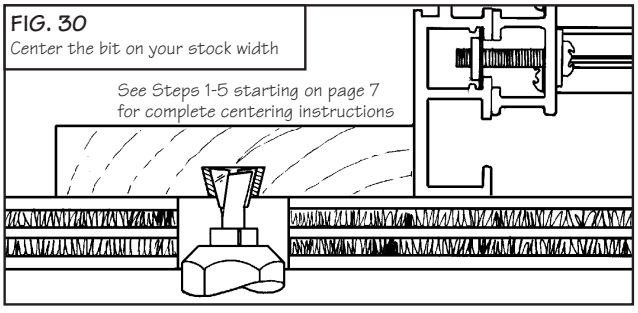
4 Determine the Pin and Tail cuts. Fig. 31 details the characteristics of a properly cut pin board and tail board. You'll notice that the tail board always begins and ends with open cuts, while a pin board will always have solid stock on its edges. As a result, it is important at this point to determine which series of cuts ("A" or "B") will be used for the tail boards and which series will be used for the pin boards. To do this, turn to the full sized diagram for the DOV1 template shown on pages 8-9. With a pencil, mark the center of the width of one of the boards to be joined. Align the pencil mark with the center cut mark (8B) on the drawing, see Fig. 32. On one side of the plans, the outer edges of the board will overlap grooves. The series of cuts on that side of the drawing will become the tail cuts. On the other side of the plans, the outer edges of the board will overlap shaded pins on the drawing. The series of cuts on that side will become the pin cuts. In the example shown in Fig. 32, you can see the edges of the board overlap grooves on the "A" side of the drawing. The "A" series of cuts will be used for the tails. The edges of the board overlap shaded pins on the "B" side of the drawing. The "B" series of cuts will be used to cut the pins.

FIG. 29
Set depth of cut



See Steps 1-3 starting on page 6 for complete depth of cut instructions

FIG. 30
Center the bit on your stock width



See Steps 1-5 starting on page 7 for complete centering instructions

FIG. 31
Pins and tails – half blind dovetails

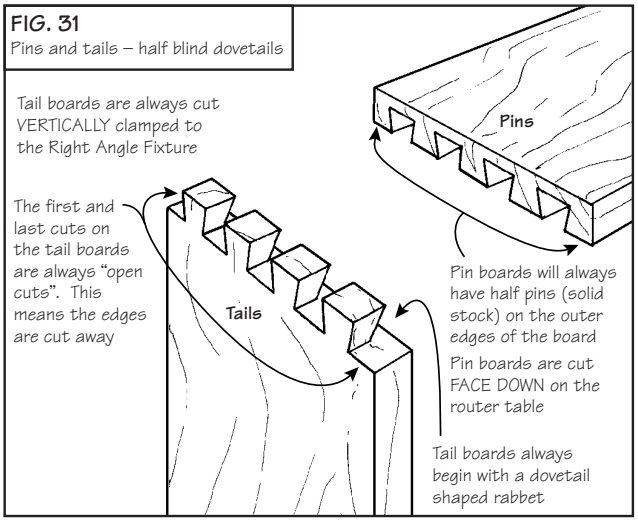
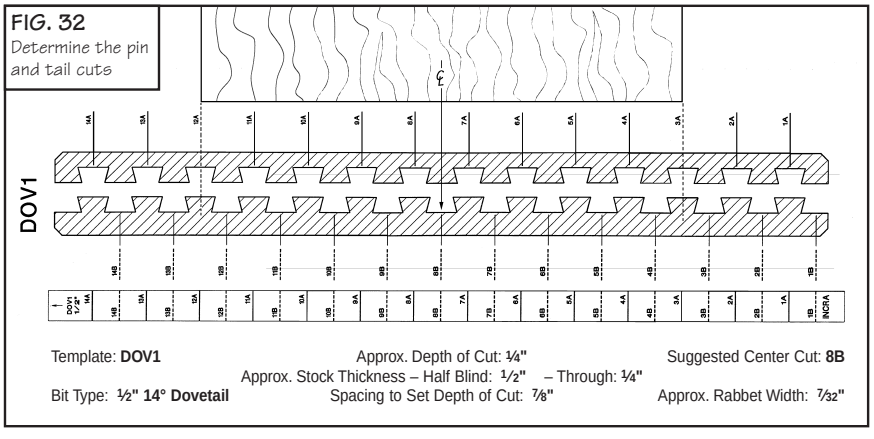


FIG. 32
Determine the pin and tail cuts



Tail Cuts

5 To cut the tails for a half blind dovetail, begin by cutting a dovetail shaped rabbet on both ends of the two boards, see Figs. 33 and 33a. The rabbet needs to be 7/32" wide. Do not cut the rabbet width in one pass. Instead, use three or four light side by side passes to sneak up on the rabbet width. You can use the 1/32" scale in your Ultra Lite as a reference so you'll know how much you have widened the rabbet with each pass.

6 Now clamp the two tail boards to your Right Angle Fixture as shown in Fig. 34, and make the tail series of cuts that you determined in Step 4. As always, using good router technique, sneak up to the first tail cut in several light side-by-side passes to avoid splintering the edge of the stock (see Tip on page 10). After completing the cuts, flip the boards end for end and repeat the cuts.

Pin Cuts

7 Set your Incra Jig to the first pin cut on the template that places the bit in front of the fence. Slide the stop positioner onto the fence and locate the stop as close to the dovetail bit as possible (without actually touching the bit) and clamp in place. See Fig. 35. The stop positioner will be used to limit the length of the pin cuts.

Place one of the pin boards face down on the router table as shown in Fig. 36 and make the pin series of cuts determined in Step 4. Be sure to use a good rubber soled push block as shown. Make the cuts on only one end of the board for now. After making the cuts, check the fit between this board and one of the tail boards. If the tails won't fit all the way into the pin sockets, simply lengthen the pin cuts by moving the stop positioner away from the router bit. (See Tip below.) Recut the pin board and again check the fit. Once you have a flush fit, make the pin cuts on the opposite end of the board and on both ends of the remaining piece.

TIP

After making your first series of cuts, check the fit with one of the tail boards. If the tail board won't fit all the way into the pin board, just measure the distance it protrudes. See Fig. 37. This is the distance you need to move the stop away from the bit to achieve a flush fit.

FIG. 37

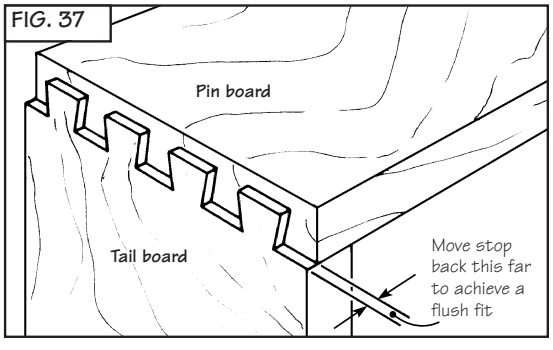


FIG. 33
Cut the rabbets

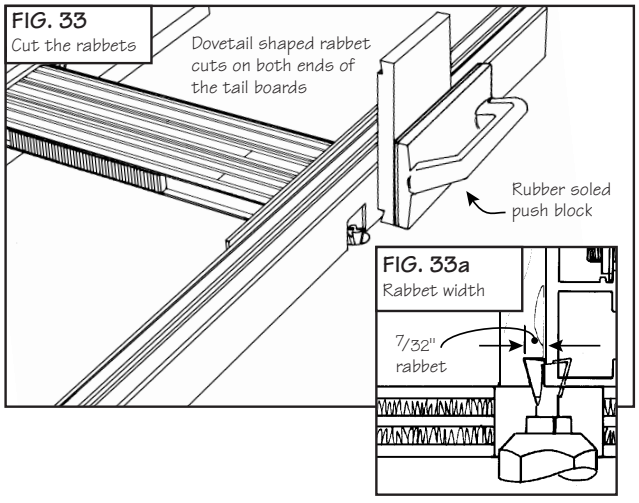


FIG. 34
Cut the tails

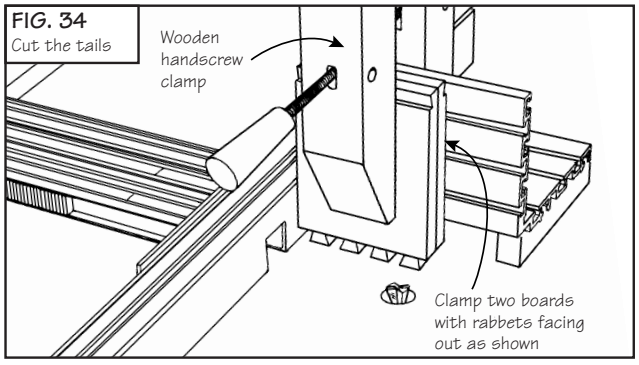


FIG. 35
Set stop positioner

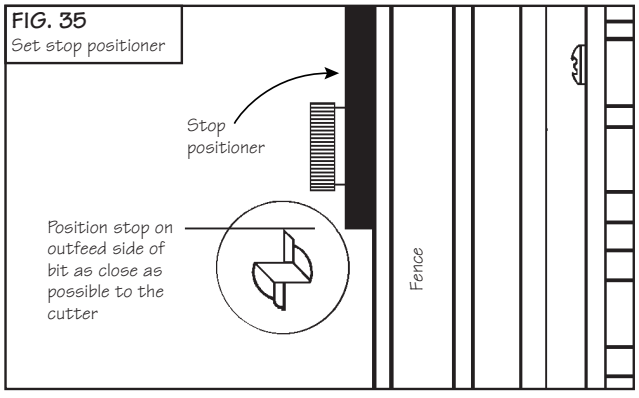
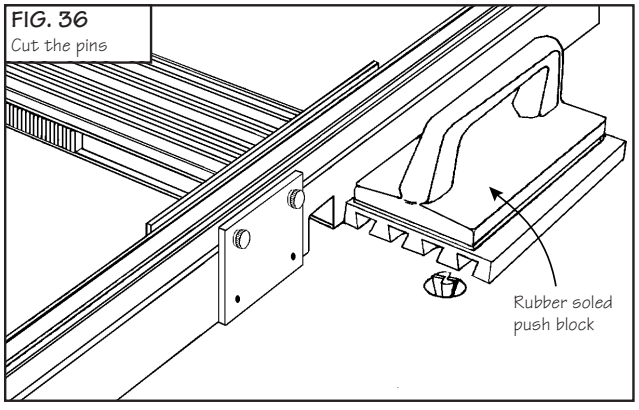


FIG. 36
Cut the pins



BEGINNER'S TIP

After making a half blind dovetail, you may notice that the joint looks symmetrical, but the edges of the two boards do not align flush, see Fig. 38. This simply means that when you centered the board using the method described in your owner's manual or *Incra Master Reference Guide and Template Library*, you were close but not quite perfect. Of course practice makes perfect, but there is another method for cutting the tail boards that will ensure a flush alignment regardless of how well your board was centered. Just make sure when you clamp the tail boards to the Right Angle Fixture that the dovetail shaped rabbets on **all** the boards **face** the cutter, see Fig. 39. That's all it takes! Remember that even if you use this procedure, you should still center first to ensure a symmetrical looking joint.

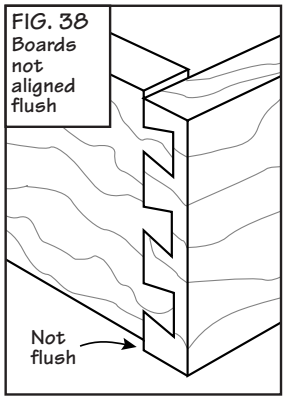


FIG. 38
Boards not aligned flush

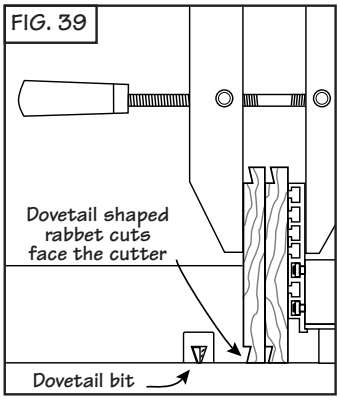


FIG. 39

VARIATIONS

The drawings at right show a standard equally spaced dovetail joint (Fig. 40) and several variably spaced dovetail joints (Fig. 41). Although these joint patterns look quite different from one another, they all have one thing in common. They are all made using the same equally spaced dovetail template. By learning the variations technique described below, you can customize the joint pattern produced by any template. This technique works not only for half blind dovetails as pictured, but also for box joints, through dovetails, and with a little study, you can even customize the decorative Double and Double-Double joints. In general, pattern variations can be designed by observing a few simple rules.

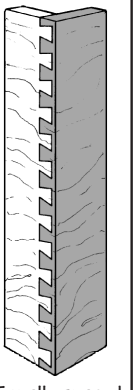


FIG. 40
Equally spaced dovetail

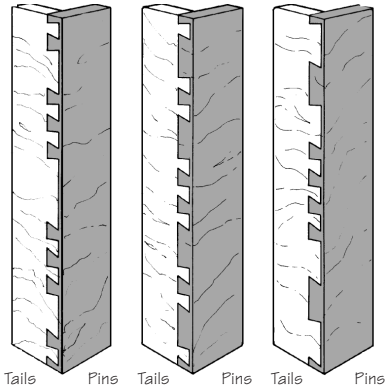


FIG. 41

1 Select cuts to be left out

Align the center of your board with the center cut you plan to use on the diagram. Then choose the cuts you want to leave off on one* side of the diagram. Determine which side of the diagram will be the pin cuts and which will be the tails (see Step 4 on page 11). Leaving cuts off of the tail side of the diagram creates wider tails. (See Example 1 on Fig. 41.) Leaving cuts off of the pin side of the diagram creates wider pins.

*****Although a bit more complicated, cuts can be left off of both sides of the diagram, resulting in a pattern variation that has both wider pins and wider tails. (see Example 3, Fig. 41)*

2 Always modify the pattern symmetrically

For example: if you decide to leave out the *first* two "A" cuts on your stock's width, you must also leave off the *last* two "A" cuts.

3 Cut the joint

Any cuts left out on one side of a pattern will be used to modify the other side. If you decide, for example, to leave off cuts 2A and 7A when you are cutting the "A" cut boards, just make cuts 2A and 7A along with all of the "B" cuts to automatically modify the "B" cut boards.

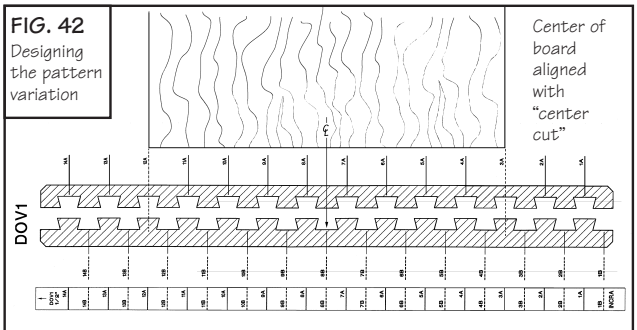


FIG. 42
Designing the pattern variation

FIRST: Align center of board with "center cut" on diagram

SECOND: Determine which cuts will be pins and which will be tails. (Step 4, page 11)

THIRD: Decide if you want the pins or the tails to be wider. Example: Leaving out the "A" cuts will create wider tails; Leaving out the "B" cuts will create wider pins.

FOURTH: Write down or circle the cuts you wish to leave out.

ADJUSTMENTS

All of the components and features of your new Incra Jig Ultra Lite have been factory set and should require no further adjustment. If, however, you wish to recalibrate these components, the following information is provided to assist in performing the adjustments.

Adjusting the Clamping Pressure

The Ultra Lite carriage clamp was designed to make it easy for the operator to adjust the clamping pressure to his/her own individual preference using the supplied clamp pad shims. Here's how:

Note: The Ultra Lite must be attached to a ¾" plywood base with all six mounting screws (see Fig. 1, page 2) before adjusting the clamping pressure.

Unlock the carriage clamp and remove the phillips head screw and washer that caps either end of the clamp pad slot. See Fig. 43. Your hardware pack for the Ultra Lite includes (3) .005" x ⅞" x 4" clamp pad shims. If you want to increase the clamping pressure, add one of the shims, check the clamping pressure and adjust further as necessary. The shims should be placed to the left of the ⅛" thick clamp pad shown in Fig. 43, so that the clamp always touches the ⅛" thick pad, and not the thin shims. To decrease the clamping pressure, simply remove one of the existing thin shims. When you are satisfied with the clamping pressure, replace the phillips head screw and washer.

Caution: If you have decreased clamping pressure by removing a shim, make certain that adequate pressure remains to hold the carriage rigidly in place when clamped in the fully extended position.

Realigning the Carriage Racks

Unlock the carriage clamp and slide the carriage so you can access the two phillips head screws that hold the rear Incra rack to the black mounting track. Tighten the two screws. Next, slide the carriage forward for access and loosen the two screws that hold the front Incra rack. The two racks should be spaced about 2" apart. Adjust the spacing by sliding the loose rack as necessary. Now position the carriage in the base so that when the carriage clamp is pulled up into the locked position the short blue clamping rack in the base bridges the gap between the two racks on the carriage. See Fig. 44. Tighten the one rack mounting screw that you have access to. Finally, unclamp the carriage clamp and slide the carriage forward to allow access to the remaining screw and tighten.

FIG. 43
Adjusting the clamping pressure

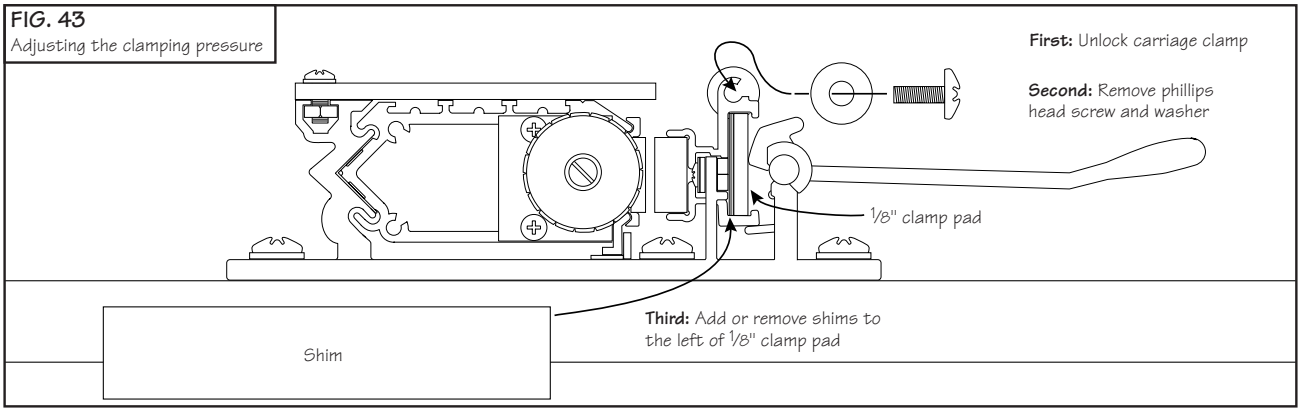
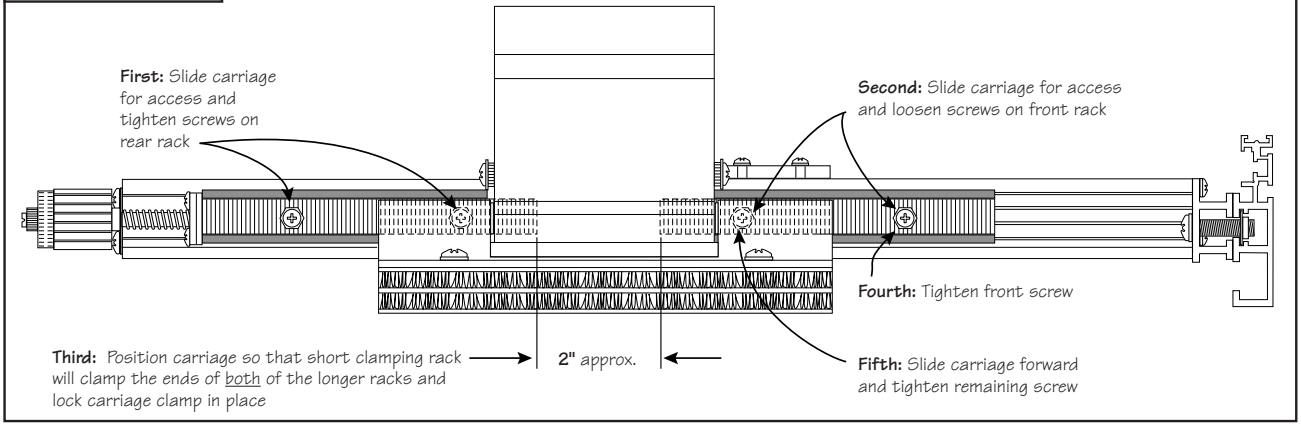


FIG. 44
Realigning carriage racks



TROUBLE SHOOTING GUIDE

Symptom	Probable Cause	Solution
Carriage clamping pressure is too tight or too loose.	Carriage clamp not adjusted properly.	Adjust clamping pressure. See page 14.
LEXAN™ scale or template is difficult to slide in scale slot.	Dirty scale slot.	Remove the scale and clean with paste wax or preferably, Top-Cote (available from your Incra dealer). CAUTION: DO NOT allow wet Top-Cote to come into contact with LEXAN scale or templates, or any other plastic material.
Racks do not mesh properly when engaging the carriage clamp.	Sawdust on racks.	Remove all debris from the racks' teeth with a stiff brush, such as a tooth brush. DO NOT attempt to clean the racks with solvents of any kind as this may damage them.
	Scale mark is not aligned directly under the hairline cursor.	After zeroing to a cutter, or after centering when joint making, make sure the carriage clamp is pulled into the locked position before sliding the scale or template into place and that the 0" or center cut mark is positioned directly under the hairline cursor. When you begin your series of cuts thereafter, always make sure the scale or template mark is aligned directly under the hairline cursor BEFORE locking the carriage clamp.
	Carriage racks are improperly aligned.	Realign the carriage racks as described on page 14.
When the jig is moved to a new position the carriage does not glide easily.	Fence is improperly mounted to the carriage.	If the fence is mounted too high or too low on the carriage, it can cause resistance when moving from one position to another. If this is the case loosen the screws holding the fence and realign. See Step 3 page 2.
	Router table surface not flat.	Bumps or dips on the table surface can force the carriage into non-parallel alignment with the base. Check the table for flatness and correct as necessary.
Fence is not square to the table surface at all jig positions.	Fence is improperly mounted to the carriage.	If the fence is mounted too high or too low on the carriage, it can change the angle of the fence relative to the table when it is moved from one position to another. If this is the case, loosen the screws holding the fence and realign. See Step 3 page 2.
	There are several possible causes: Jig mounting board is not flat, table is not flat, debris between table and mounting board or between mounting board and jig.	If you identify any of these, take steps to correct the problem. You can also use shims to bring the fence into perfect square as described in Step 5 on page 3.
Micro adjusting knob will not rotate or is difficult to rotate.	Carriage clamp is not "unlocked".	Carriage clamp must be unlocked, then the clamp handle must be pushed down and held to place the jig in the micro adjust mode. See Steps 1-4 page 4.
	Jig is micro adjusted to the end of the forward travel range.	Micro adjust back to mid-range position as indicated by the micro adjust range scale. Turn knob counter clockwise until "0" on the scale is aligned with the end of the black bar on the far side of the carriage. See Fig. 8 page 4.
Micro adjusting knob rotates but no movement of the carriage or fence.	Jig not in micro adjusting mode.	After unlocking the carriage clamp, the clamp handle must be pushed down and held to place the jig in the micro adjust mode. See Steps 1-4 page 4.
	Jig micro adjusted beyond end of backward travel range.	Micro adjust jig forward to mid-range as indicated by the micro adjust range scale. Turn knob clockwise until the "0" on the scale is aligned with the end of the black bar on the far side of the carriage, see Fig. 8 page 4.

PARTS AND OPTIONAL ACCESSORIES

Part #	Part Description	Price
IJUL-CURSOR	Hairline Cursor (with mounting hardware)	$ 4.95
IJUL-STOP	Stop Positioner (with mounting hardware) as shown in Fig. 4 on page 3	$ 6.95
IJUL-FENCEUP	Fence upgrade kit. Includes: (1) Incra Stop (premium model) (4) 1/32" Incra racks (1) 16" long 1/32" scale Mounting hardware	$24.95
MTL2	*Incra Master Reference Guide and Template Library* Exciting new joinery techniques plus 38 new patterns to choose	$24.95
IJPT1	*Incra Jig Projects & Techniques Book* Features 14 original Incra projects, 4 exclusive new Incra joints, and a wealth of tips and techniques that will help you master the Incra Jig	$22.95
IJUL-MMRACK	Metric conversion kit — set of 3 metric racks with 430mm metric scale	$ 6.95
IJU-MMSCALE	430mm metric scale	$ 2.95
IJU-32SCALE	16" long 1/32" scale (set of 2)	$ 3.95
PUSHBLOCK	Rubber soled push blocks	$ 7.95

PRODUCT INFORMATION

For a product information update on the complete Incra line of tools, please see your nearest dealer. If you are unable to locate a store nearby, or if you have trouble finding a particular product, we will honor your order directly.

For a product information brochure, call, write or fax to:
Taylor Design Group, Inc.
P.O. Box 810262, Dallas, TX 75381
Tel: (972) 418-4811 Fax: (972) 243-4277
Web Site: www.incra.com

WARRANTY

Taylor Design Group, Inc. warrants this product for one year from date of purchase. We will repair any defects due to faulty material or workmanship, or at our option, replace the product free of charge. Please return the failing component only, postage prepaid, along with a description of the problem to the address below. This warranty does not apply to parts which have been subjected to improper use, alteration, or abuse.

LIFETIME WARRANTY ON POSITIONING RACKS

If an Incra positioning rack in this tool becomes damaged for ANY reason, Taylor Design Group will replace it free of charge for as long as you own your tool. Return the damaged rack, postage prepaid, and allow 1 to 2 weeks for delivery.

NOTE:
Replacements cannot be sent unless damaged racks have been received by Taylor Design Group.

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